

Claims:

1. A method of accessing upper-layer headers in a packet flow, comprising the steps of:
  - a) responsive to a packet header containing extension headers, building a cache key and performing a cache lookup for a cache entry; and
  - b) responsive to finding a corresponding cache entry, reading extension headers in parallel using the cache entry to arrive at and read fields in the upper-layer header.
2. The method as defined in claim 1 wherein the packet flow comprises IPv6 packets.
3. The method as defined in claim 2 wherein the cache lookup is performed on a table containing lengths of extension headers using a tuple comprising based on the fields present in the IPv6 header
4. The method as defined in claim 3 including the step of reading the first extension header in the group of extension headers while the cache lookup is being performed to further reduce packet processing times.
5. The method as defined in claim 1 wherein if no cache entry is found, performing a serial read of the extension headers and caching information on the lengths of these extension headers for processing subsequent packets in the same flow.
6. The method as defined in claim 1 including the step of detecting packets with hop-by-hop and routing extension headers and determining whether options processing of those packets is required.

7. The method as defined in claim 6 wherein, responsive to a packet not containing extension headers, read the upper-layer header without performing a cache lookup.
8. The method as defined in claim 1 wherein if the extension headers are constantly changing resulting in incorrect cached data, the extension headers are traversed serially.
9. The method as defined in claim 8 wherein the constantly changing extension headers are detected using a manual configuration.
10. The method as defined in claim 8 wherein the constantly changing extension headers are determined dynamically based on observations of the packet flow.
11. The method as defined in claim 1 wherein if the cached data does not match the packet the cache entry is not updated.
12. The method as defined in claim 11 wherein detection that the cache does not match the packet is enabled manually.
13. The method as defined in claim 11 wherein detection that the cache does not match the packet is enabled based on flow observations.
14. The method as defined in claim 1 wherein information from the upper-layer header is cached.
15. The method as defined in claim 14 wherein the cached information includes protocol and source and destination port identification.

16. The method as defined in claim 1 wherein results of classification and lookups performed during regular packet processing are cached.
17. A system for accessing upper-layer headers in a packet flow, comprising:
  - means responsive to a packet header containing extension headers, for building a cache key and performing a cache lookup for a cache entry; and
  - means responsive to finding a corresponding cache entry, for reading extension headers in parallel using the cache entry to arrive at and read fields in the upper-layer header.
18. The system as defined in claim 17 wherein the packet flow comprises IPv6 packets.
19. The system as defined in claim 18 wherein the means for performing a cache lookup examines, in parallel, information from the header to use in reading a first extension header.
20. The system as defined in claim 19 wherein if no cache entry is found means for reading extension headers traverses the headers serially.
21. The system as defined in claim 17 including means to specify, in certain situations, that cached data should not be used to attempt to accelerate packet processing.
22. The system as defined in claim 17 further including means to cache upper-layer header information.

23. The system as defined in claim 22 wherein the upper-layer header information includes protocol, and source and destination ports.